Deliverable document for

Washington State Office of Financial Management

Grants, Contracts, and Loans Management System Project High-Level Fit/Gap

Hardware / Software Specifications

✧ Sierra Systems

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1. INTRODUCTION

The proposed solution for the Grants, Contracts, and Loans Management System (GCLM) has a significant number of components and software that are used to provide its services. The configuration and implementation of these items can be different from system to system and is documented here for the specific needs of this solution.

2. PURPOSE

The purpose of this document is to detail the hardware and software specifications for the solution that will achieve the desired outcome as documented in the RFP.

This Hardware and Software Specifications document is a living document that will be revised and the information fine tuned as the project progresses. This information represents the recommended configuration based on our initial information and meetings with OFM.
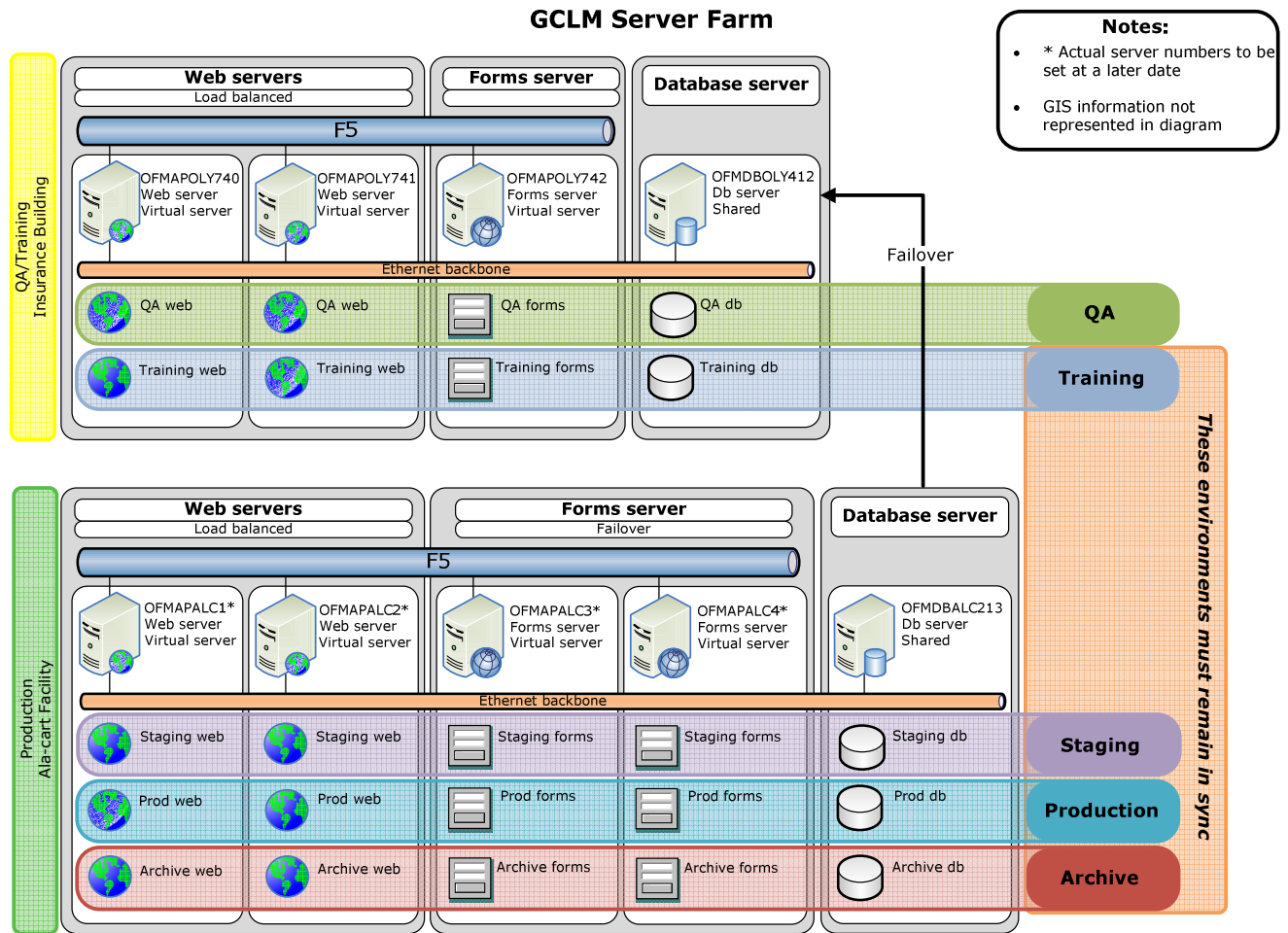
A revision log will be maintained in this document and the document must be resubmitted for sign-off after completion of material revisions. Any such material revisions are subject to the change control process, outlined in the Project Charter.

3. ENVIRONMENTS

This section describes the environments that will be required to support the solution and their intended purpose. Each environment is expected to be configured identically to production and the details of the hardware can be found in the next section.

The location of these environments is split between DIS and OFM such that DIS will house all production environments and OFM will house the QA and training environments. OFM will maintain all environments regardless of their physical location.

Below is the anticipated server environment configuration that the solution will utilize. The exact performance requirements of some of these systems will depend on usage characteristics defined by OFM's adopted workflow for system updates and maintenance. Therefore, the exact hardware configuration required will be elaborated in the pilot phase of the project.

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GCLM Server Farm

3.1. Environments at OFM

OFM will house the QA and training environments internally at the OFM managed facility for non-production use.

3.1.1. Quality Assurance (QA)

This environment will be used to verify and test system changes prior to their rollout to the production environment. This environment will be configured the same as production but will have the latest testing version of the application.

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This is also the environment that will be used to troubleshoot any issues identified in production to ensure it can be replicated in the latest build of the application.

3.1.2. Training

The training environment will be used by OFM to provide training to the users of the system. It will contain the version of the application that is currently deployed in production and be refreshed as the production environment is refreshed.

3.2. Environments at DIS

OFM will co-locate the remaining environments in the DIS a-la carte server room.

3.2.1. Staging

The staging environment is the environment where authorized users configure and test new agreement opportunities and other data. Once these agreement opportunities are complete and tested, they are migrated to the production environment.

3.2.2. Production

This is the main operational environment that will host the application for all users of the system.

3.2.3. Archive

The archive environment stores production data that is no longer required to be readily accessible in the mainstream application. This is a parallel environment to production, but is using data that is no longer required to be editable. Data is moved to the archive environment based on business rules regarding retention.

4. HARDWARE

This section outlines the hardware necessary to operate the application at the server and the client workstations. The information in this section is intended to describe the hardware required for operation.

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4.1. Client Workstation Hardware

The client workstations use a thin client browser to interact with the server software of the application and thus do not require significant hardware.

- CPU: Intel Pentium 4 2.4 GHz or better (or comparable performing brand)
- Memory: 512 MB (recommend at least 256MB greater than minimum OS recommendation)
- Video: 800 x 600 or greater
- Hard drive: 10 GB or greater
- Internet connectivity

While these specifications are the minimum requirements, additional hardware can improve the experience for the user. Performance of the application for the end user is greatly dependent on the Internet connectivity of the users. The application is designed to minimize the downloaded files for the client.
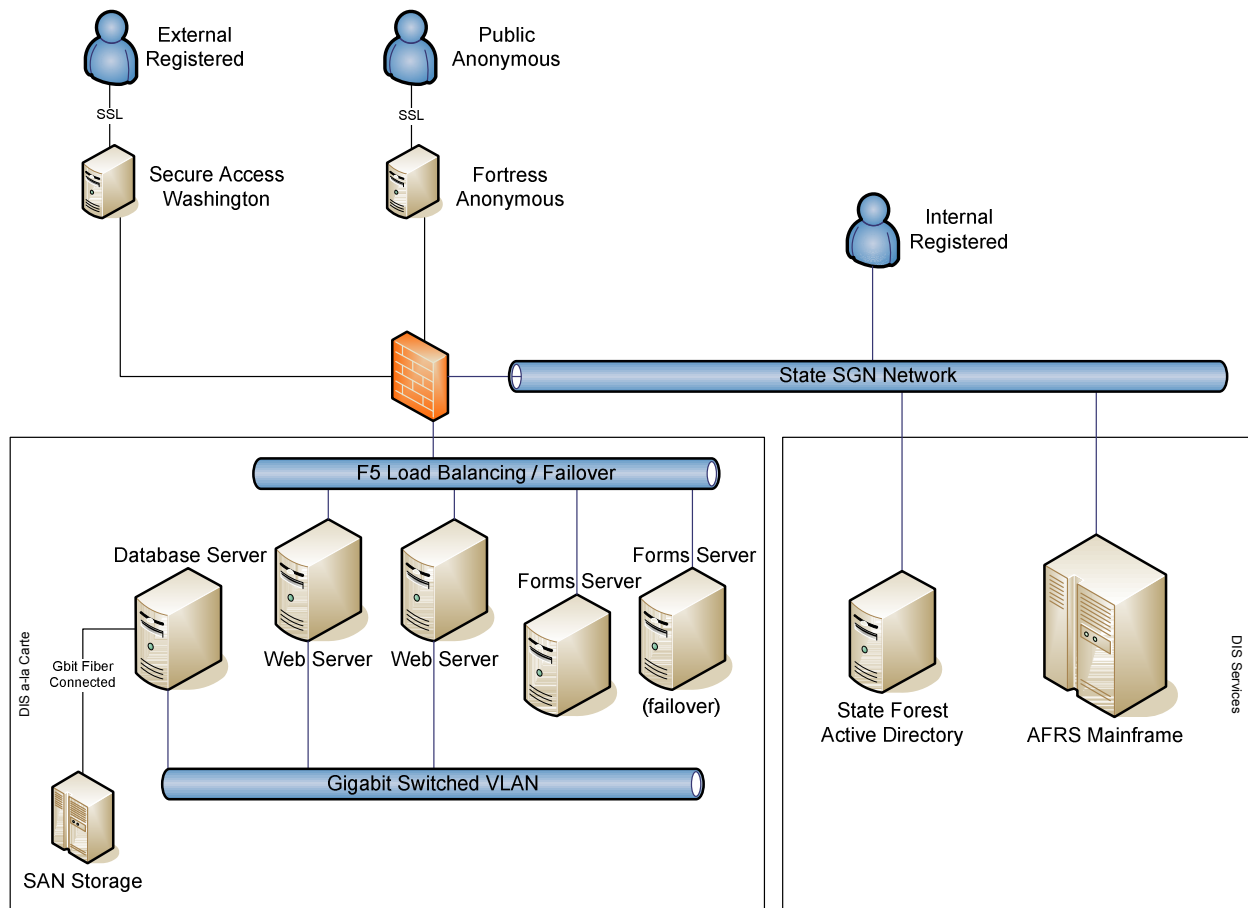
4.2. Server Hardware

The hardware for the solution will be a mixture of physical components and virtual machines as indicated above in the environments section. The hardware in this document is a recommended starting point for the project and will evolve over time as more information is collected during load testing in the pilot phase of the project.

The hardware specifications listed in this section are reflective of the production environment needs. The application can run on lesser hardware for the other environments at the expense of performance. The pilot phase will be used to formalize the exact hardware requirements for all environments.

The architecture of the system is designed such that it can be configured with more hardware as needed to meet the load and timing requirements outlined in the RFP. Thus if the response times begin to fall outside of the acceptable ranges additional hardware can be added to bring the response times back in line with the requirements.

The system's capacity needs will increase over time given the volume of transactions indicated in the RFP. The solution will likely include the utilization of a SAN disk array that will support expanding the disk space as needed. The performance and expandability of the data storage mechanism is a critical component of the installed system. The solution also enlists a parallel environment to production for archiving data that is no longer being edited.

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4.2.1. Physical Hardware

The above diagram shows the conceptual configuration for the physical hardware required for a single environment. Several of the environments will be using the same physical hardware but conceptually are separate machines due to the virtualization of the hardware. This diagram is somewhat simplified compared to the real networking in place.

The following list contains hardware specifications for the proposed solution to perform based on the specifications given in the RFP. This is not an exhaustive list of all the physical hardware needed as there are many components that are assumed to be in place by OFM and DIS. The term "Performance Tested" in the list below refers to the hardware configuration used in the load testing performed by OGMA as described in Appendix A.

Component	Description
Hardware Load	Given the 2 physical locations for all the environments we

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Balancer	will require 2 F5 load balancers. The current hardware at DIS and OFM is sufficient for the needs of the system.
Application Server	There will be 2 physical servers to support the needs of the web and form servers. Minimum: <table><tr><td>**CPU**</td><td>2 dual core 2.6 GHz</td></tr><tr><td>**Hard Drives**</td><td>36 GB / virtual machine</td></tr><tr><td>**Memory**</td><td>20 GB</td></tr></table> Performance Tested: <table><tr><td>**CPU**</td><td>4 dual core 2.6 GHz</td></tr><tr><td>**Hard Drives**</td><td>36 GB / virtual machine</td></tr><tr><td>**Memory**</td><td>32 GB</td></tr></table> Recommended: <table><tr><td>**CPU**</td><td>4 quad core 2.6 GHz</td></tr><tr><td>**Hard Drives**</td><td>36 GB / virtual machine</td></tr><tr><td>**Memory**</td><td>32 GB</td></tr></table>
Database Server	The database servers will not be virtualized and run SQL Server 2005 directly on the host. Minimum: <table><tr><td>**CPU**</td><td>4 dual core 2.6 GHz</td></tr><tr><td>**Hard Drives**</td><td>36 GB local storage Database storage as described below.</td></tr><tr><td>**Memory**</td><td>32 GB</td></tr></table> Performance Tested: <table><tr><td>**CPU**</td><td>4 dual core 2.6 GHz</td></tr></table>

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	Hard Drives	36 GB local storage Database storage using attached Raid 10 and SAN attached storage.
	Memory	32 GB

Recommended:

CPU	4 quad core 2.6 GHz
Hard Drives	36 GB local storage Database storage as described below.
Memory	32 GB

Storage Requirements	Capacity: Typical O&PEN installations have required 3GB initial database capacity, growing to 10, 20, and 30 GB annually. Based on the expected GCLM usage, database capacity will likely be closer to 100, 200, and 300 GB during the first three years of deployment. Performance: The database storage device needs to be sufficiently capable of delivering data quickly with low latency. To achieve these requirements, the hardware components must be selected carefully and configured to support the performance needs. Minimum: 100 MB/s throughput regardless of other activity on the storage device (in the case of shared SAN). Recommended: 150 MB/s or greater throughput
Network Switch	The servers should be connected to a switch that supports at least 1 Gbit network traffic and should be configured directly between the servers to reduce the latency of the calls

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	between them.
Fault Tolerance, high availability, and Redundancy	Given the nature of the installed system, each system should be designed and configured with fault tolerance and disaster recovery in mind. A survey of projected system users yielded 1 to 4 hours acceptable down time due to system maintenance or failure.
	To accomplish this:
	• Data should be replicated across multiple physical devices through RAID, SAN, etc.
	• Data storage should employ a multi-location data recovery model.
	• With the expected size of the production database, some form of periodic database replication should be employed to enable fast failover to a different database server in the event of a catastrophic hardware failure. Based on the expected installation, this could consist of a nightly restore of the production database to the QA database server.
	• Some failover mechanisms should be in place, the latency of which is determined by likelihood such as:
	- (high likelihood, 0 downtime) Fault tolerant disk array allowing hot replacement of failed drives without loss of data.
	- (high likelihood, 45 seconds downtime) Failure sensing F5 load balancer redirecting of requests to live systems in the event of server malfunction or maintenance.
	- (medium likelihood, 1 hour downtime) Online availability of mirrored production data in a remote location in the event of a large storage array failure.
	- (low likelihood, 4 hours downtime) Mirrored hardware devices in multiple locations enabling fast switching of the production environment location in the event of catastrophic hardware

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	failure in the primary environment.

4.2.2. Virtual Machines

Virtual Machines will be used to reduce the overall cost of deployment and maintenance for the solution. These virtual machines will be used for all components of the solution except the database servers, as they require physical hardware to run efficiently.

The disk space allocated to the virtual machines must be configured as pre-allocated drives so that there is no dynamic growth, negatively impacting performance.

Component	Description
Web Server	There will be 2 virtual machines in each physical location running as web servers for the application environments at that location. Minimum: <table><tr><td>**CPU**</td><td>2 dual core 2.6 GHz</td></tr><tr><td>**Hard Drives**</td><td>12 GB – OS partition 24 GB – Application partition</td></tr><tr><td>**Memory**</td><td>4 GB</td></tr></table> Recommended: <table><tr><td>**CPU**</td><td>4 quad core 2.6 GHz</td></tr><tr><td>**Hard Drives**</td><td>12 GB – OS partition 24 GB – Application partition</td></tr><tr><td>**Memory**</td><td>16 GB</td></tr></table>
Forms Server	There will be a single virtual machine in each physical location that is running the Scriptura Forms server. Minimum:

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CPU	2 dual core 2.6 GHz
Hard Drives	12 GB – OS partition 24 GB – Application partition
Memory	2 GB

Recommended:

CPU	4 quad core 2.6 GHz
Hard Drives	12 GB – OS partition 24 GB – Application partition
Memory	4 GB

5. SOFTWARE

5.1. Base Server Software

The base software consists of those products that are required to run normal machine operations and are managed by OFM through their normal licensing process. While additional software may be installed on these systems, this list contains only the software that is required. The base software is listed by machine type:

- Database Servers (64-Bit)

    o Microsoft Windows Server 2003 Standard Edition SP2

    o Microsoft SQL Server 2005 Standard - Database

- Forms Servers (64-Bit)

    o Microsoft Windows Server 2003 Standard Edition SP2

    o Microsoft SQL Server 2005 Standard - Connectivity Tools

    o Microsoft SQLXML OleDB Provider

- Web Servers (32-Bit)

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- o Microsoft Windows Server 2003 Standard Edition SP2

- o McAfee VirusScan Enterprise 8.0

- o Microsoft SQL Server 2005 - Connectivity Tools

- o Microsoft SQLXML OleDB Provider

The base software being utilized is standard Microsoft technology that will allow OFM to manage the application using their existing tools for things such as performance measurement, health monitoring, backup and recovery, disaster recovery, etc.

5.2. O&PEN Server Software

The following table outlines the information for software that is required to deploy and run the solution which is not provided by OFM.

O&PEN Application Software	
Primary Vendor	OGMA Consulting Corp.
	14 – 3318 Oak Street Victoria, BC V8X 1R1, Canada
	Phone: 250-475-0555 Fax: 250-475-1063
Licensing	Purchased as a complete site license covering the following environments: Production, QA / Test, Training, and Archive.
Maintenance	Annually
Contact	Terry Curtis

Scriptura XBOS Server (Forms and Report Rendering engine)	
Primary Vendor	Inventive Designers
	Sint-Bernardsesteenweg 552 B-2660 Belgium
	Phone: +32 3 821 01 70 Fax: +32 3 821 01 71
Reseller	OGMA Consulting Corp.

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Licensing	Purchased on a per core or VM processor.
Maintenance	Annually
Contact	Terry Curtis (OGMA)

Scriptura Designer

Primary Vendor	Inventive Designers
	Sint-Bernardsesteenweg 552 B-2660 Belgium
	Phone: +32 3 821 01 70 Fax: +32 3 821 01 71
Reseller	OGMA Consulting Corp.
Licensing	Purchased on per workstation (single user).
Maintenance	Annually
Contact	Terry Curtis (OGMA)
Notes	It is recommended to obtain 2-3 licenses of this tool if they are required. The actual requirement for these licenses is to be discussed during the pilot phase of the project and further detailed with a decision on reporting method.

Spell Checker Software

Primary Vendor	SpellChecker.net
	PO Box 641697 Los Angeles, California 90064
	Phone: 310-287-2001 x801 Fax: 310-287-2347
Reseller	OGMA Consulting Corp.
Licensing	Per server license. **NOTE**: Number of servers will depend upon the topography of the network and ability of a licensed copy of the product to

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	support multiple environments (Production, Test / QA, Development, Training and Archiving).
Maintenance	Annually
Contact	Terry Curtis (OGMA)

When OGMA purchases these third-party licenses on behalf of a client, the software product publisher / owner receives a record of the end user / client organization for which the software is installed. Ongoing annual maintenance then becomes the responsibility of the client organization.

5.3. Client Workstation Software

The client workstations do not require much software to be able to interact with the solution. The solution requires only basic browser functionality that is supported in most mainstream current browsers.

O&PEN supported browsers:

- Microsoft Internet Explorer – 6.0 & 7.0
- Netscape Navigator – 7.0 & 8.0
- Firefox – 2.0

There are some features of the application that can be used to produce and read documents in a variety of format which may require the user to have one or more of the following software applications:

- Microsoft Word
- Microsoft Excel
- Adobe Acrobat Reader

The above software is not required to use the application except where a document is uploaded or downloaded in the corresponding format. Additionally, attachments of different formats will require compatible software for viewing or editing of the attachments (i.e., Microsoft PowerPoint, AutoCAD, ESRI ArcEditor, etc.).

The application does not restrict operation to any specific operating system but has been tested and verified on the operating systems outlined in the RFP (Windows XP and Windows Vista).

6. ASSUMPTIONS

This document was prepared during the initial 45 day evaluation using the following assumptions:

- Hardware load balancing will be included in the pilot phase of the project as it requires additional implementation on the servers.

- GIS functionality and implementation details were not known at the time of writing due to the progress of the dependent projects.

- Hardware configuration is based on previous O&PEN deployments, but capacity and load testing will be required in the pilot phase to determine the final hardware requirements.

- Fault tolerance and system availability were not the main focus of this specification. The items in this document regarding fault tolerance and redundancy are illustrative. It is up to OFM and DIS to ensure that the installed system supports the appropriate amount of fault tolerance to fulfill OFM's availability requirements for the GCLM product.

- Evaluation of the response times of the installed system is based on a clean installation in a clean environment. OFM and Sierra Systems acknowledge that response times will be affected by circumstances beyond the control of the installed system.

- It is assumed that there are areas of the application including reports and dynamic creation of PDF files that will fall outside of the 2 – 5 second response range.

- A concurrent user is defined such that they will be using the system at the same time but under a typical usage pattern and not a constant series of requests each second. Thus 2000 concurrent users could mean 200 – 500 simultaneous requests at one time rather than the full 2000 users.

- Not all non-functional requirements are detailed in this document as it focuses on the hardware and software only.

7. TRACEABILITY MATRIX

This section will document the traceability to the requirements that were driving this information and configuration as well as the status. The following table contains the non-functional requirements as defined in the RFP.

The matrix in this section will define the traceability for the contents of this document and there are likely to be many of them that do not apply to the Hardware and Software Specification

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document. The requirements that do not trace to this document are listed for completeness. The team may move the traceability matrix to an external document as the project progresses.

The section column will have a link to the section that contains the relevant trace data for the requirement. Those entries that are blank do not pertain to this document.

Req #	Description	Section
5.1.2.1	Platform and Operating System The proposed Solution must run on the hardware platform / operating system describe below.	4, 5
5.1.2.1.1	OFM standard Intel based hardware with Microsoft Windows 2003 Operating Systems on all servers.	4, 5
5.1.2.1.2	OFM VM-Ware data center environment.	4.2.2
5.1.2.1.3	OFM platform configuration, which consists of hardware load balancing, 2.8 GHz two and four Dual Core Processors, and up to 16 GB Random Access Memory.	4
5.1.2.2.1	The proposed Solution must utilize OFM standard Microsoft SQL 2000 or greater.	5.1
5.1.2.2.2	Ease of access to the database using external tools for reporting such as Business Object XI.	
5.1.2.3	Application Architecture and Performance Once the proposed Solution has scaled to an enterprise system for Washington State it is anticipated the proposed Solution will handle in excess of 250,000 contract documents and related data per year (it is OFM's intention to have an infinite number of electronic versions of signed agreements and related data elements) and in excess of 35,000 users.	4.2
5.1.2.3.4	The solution must display the screens within OFM's benchmark of five (5) seconds for external users.	4
5.1.2.3.5	The solution must display the screens within OFM's benchmark of two (2) seconds for internal users.	4

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5.1.2.3.6	Describe the capability of the proposed Solution to continue functioning properly, without performance degradation, with more than 2,000 concurrent users.	4
5.1.2.3.7	Describe the capability of the proposed Solution for system administrators to monitor response time, system use and capacity, concurrent users, and system errors.	5
5.1.2.3.8	The proposed Solution must be scalable, with simplicity of scaling options for all aspects of hardware, software, site management services, connectivity, and the number of concurrent users.	4
5.1.2.3.9	Provide a description of any "built in" fault tolerant features of the proposed Solution.	
5.1.2.3.10	The state's single sign on strategy for users outside the State Government Network (SGN) is for applications to use the authentication services provided by the SecureAccess Washington gateway described at http://techmall.dis.wa.gov/services/secure_access_wa.aspx. External users must be able to access the proposed Solution from the Internet through Fortress Anonymous or Secure Access Washington using a user ID and password, or through Transact Washington using a digital certificate.	4.2.1
5.1.2.3.11	The proposed Solution data must be able to be backed up and recovered through Veritas Backup Exec and TSM technology to copy data to tape for off-site storage.	5.1
5.1.2.3.12	Provide an explanation of how the proposed system will manage storing and retrieving an infinite number of electronic documents.	4
5.1.2.4.1	The proposed Solution must support the State's adopted standards for client workstation operating systems using Microsoft's Windows XP and Vista, and Internet browser environments using Microsoft's Internet Explorer versions 6.x and greater.	5.3
5.1.2.4.2	Thin client architecture is the OFM preferred model. The proposed Solution must have a browser based thin client user interface for all system users and not dependent on a specific browser. The proposed Solution must not require any Vendor supplied software to be loaded onto a user's workstation prior to use, except for assistive technologies such as: Java applets, ActiveX, Adobe Reader and the like. The proposed Solution must not be dependent on any specific	5.3

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	workstation operating system. All client print options must be browser based.	
5.1.2.4.5	Describe the minimum client workstation (CPU, memory, video, and hard disk requirements) required to use the application with reasonable results. Reasonable means the application is not consuming more than 50% of the available CPU and application results are available in less than five (5) seconds elapsed time.	4.1
5.1.2.5.1	The Vendor must provide an application programming interface (API) or software development kit (SDK) along with associated tools and documentation, including database schema, for the purpose of integrating the proposed Solution's functionality into other software solutions.	
5.1.2.5.2	The proposed Solution must provide a well-documented and unrestricted API, SDK and/or web service.	
5.1.2.5.3	OFM desires that API, SDK and/or web services expose synchronous and asynchronous messaging capabilities.	
5.1.2.5.4	OFM desires that, if a web service or series of web services are available, they meet WS-* standards.	
5.1.2.5.5	OFM desires that API's allow for asynchronous invocation of services.	
5.1.2.5.6	The state's Information Service Board (ISB) Enterprise Integration Architecture (EA) has established standards designed to enable loosely coupled integration of agency-to-agency data and system-to-system communication. Interfaces within the proposed Solution must conform to one or more of the state's EA standards, which include Web Services, MQ Service, and File Drop Service and to the related standards for service modeling, integration design, shared infrastructure, and service repository provided by the Enterprise Integration Service (EIS). The ISB EA Integration Architecture Standards are at: available at: http://isb.wa.gov/policies/eaprogram.aspx	
5.1.2.6	OFM is migrating to MS Windows Server 2003x64 and MS SQL 2005x64 and should be completed by December 2007. The proposed Solution must be completely functional and fully supported in this environment.	4.2, 5.1, 5.2
5.1.2.7	The OFM considers it highly desirable that the proposed Solution support seamless integration with Microsoft Office products (MS Word, Excel, and Outlook) for basic word processing, spreadsheet,	

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	email and calendaring functions.	
5.1.2.8	The proposed Solution must be accessible to individuals with disabilities. This requirement includes Web sites, Web-based applications, software systems, and electronically published documents. These technologies must provide the same functionality to individuals with disabilities as it provides to individuals without disabilities.	
5.1.2.8.1	**Principle 1:** Content must be perceivable. Describe how the proposed Solution meets the following: a. Provides text alternatives for all non-text content. b. Provides synchronized alternatives for multimedia. c. Ensures that information, functionality, and structure are separable from presentation. d. Makes it easy to distinguish foreground information from background images or sounds.	
5.1.2.8.2	**Principle 2:** Interface elements in the content must be operable. Describe how the proposed Solution meets the following: a. All functionality is operable via a keyboard or a keyboard interface. b. Allows users to control time limits on their reading or interaction. c. Allows users to avoid content that could cause seizures due to photosensitivity. d. Provides mechanisms to help users find content, orient themselves within it, and navigate through it. e. Helps users avoid mistakes and makes it easy to correct them.	
5.1.2.8.3	**Principle 3:** Make text content readable and understandable. Describe how the proposed Solution meets the following: a. Ensures that the meaning of content can be determined. b. Organizes content consistently from "page to page" and make interactive components behave in predictable ways.	
5.1.2.8.4	**Principle 4:** Content must be robust enough to work with current and future technologies. Describe how the proposed Solution meets the following: a. Uses technologies according to specification. b. Ensures that user interfaces are accessible or provide an accessible alternative(s).	
5.1.2.8.5	Vendors must complete a Voluntary Product Accessibility Template (*http://www.access-star.org/ITI-VPAT-v1.2.html*) for the proposed Solution and submit a copy with their Response.	

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5.1.2.8.6	Washington State Accessibility Guidelines can be found at: *http://isb.wa.gov/tools/webguide/accessibility.aspx*. The proposed Solution must adhere to the Washington State Accessibility Guidelines and the Web Accessibility Principles and the Software Accessibility Requirements published by the Information Services Board (ISB) in June 2005. The following requirements are mandatory.	
	1. At least one keyboard method must be available for any available function, if that function or its result can contain a text label or can be identified with text. Applicable keyboard functionality may include, as appropriate, navigation by Tabbing, Access Keys, and Pull-Down Menus with Hot Keys. Describe how the proposed Solution meets this **Keyboard Access** requirement.	
	2. The identity, operation and state of all user interface elements must be available to assistive technology through the use of text labels. When an image is used to represent a program element, the information conveyed by the image must also be available in text. Describe how the proposed Solution meets this **Object Information** requirement.	
	3. Applications must not disrupt or disable activated and documented accessibility features of other products where those features are developed according to industry standards. Applications also must not disrupt or disable activated and documented accessibility features of the operating system.	
	4. A well defined on-screen indication of the current focus must be provided that moves among interactive interface elements as the input focus changes. The focus must be programmatically exposed so that assistive technology can track focus changes.	
	5. When bitmap images are used to identify controls, status indicators, or other programmatic elements, the meaning assigned to those images must be consistent throughout the application. Inconsistent use of program elements violates good practices in Programming Usability, UI Design, and Accessible Software Design.	

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	6. Text content, text input caret location, and text attributes must be provided through operating system functions for displaying text.	
	7. User selected attributes in the operating system, such as color and contrast selections, must be respected by the application.	
	8. At least one non-animated presentation mode must be available. This requirement can be met by allowing the user to skip animation or can be met by providing the information being delivered by the animation in an accessible, non-animated form.	
	9. Color must not be the only means of conveying information such as an action, prompting a response, or distinguishing a visual element. Use of color to convey information is not discouraged. Rather, the use of color as the only means of communicating information is forbidden.	
	10. Color and contrast adjustment options must be provided to accommodate varying visual needs.	
	11. Software must not use flashing or blinking text, objects, or other elements having a flash or blink frequency greater than 2 Hz and lower than 55 Hz.	
	12. Forms must allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues. If keyboard alternatives are provided for navigating through a form, and all elements of the form, including fields to be completed, have sufficiently descriptive text labels located near them, the form is more likely to meet this requirement.	
5.1.3.1	The State has implemented Enterprise Active Directory (EAD) at some agencies for internal users of the shared State Government Network (SGN). The state's single sign-on strategy is to minimize the establishment of multiple user stores for application authentication. The proposed Solution must be implemented in and protected by the security gateways of the SGN (see section 5 of the ISB Security Standards), provide application level user and roles based authentication and authorization tools, and integrate with the state's EAD system.	

5.1.3.2	The Washington State Information Services Board (ISB) has developed guidelines and standards to help State agencies implement, as part of their IT risk management effort, an Information Technology (IT) security program. State IT Security policy and standards can be found at http://isb.wa.gov/policies/security.aspx. The proposed Solution must meet this standard. Describe how the proposed Solution meets this standard.	
5.1.3.3	Security must include the ability to control access to confidential data based on agency, group, role, or user authorization rights. Administration of these controls must be a separate and distinct role within the proposed Solution. The proposed Solution must provide a way to accomplish this goal.	
5.1.3.3.1	Passwords in the proposed Solution must never be exposed as clear text.	
5.1.3.3.2	For users outside of the State Governmental Network and not authorized by Active Directory, the proposed Solution must meet the password requirements for strength and retention as described in the State IT Security policy and standards that can be found at http://isb.wa.gov/policies/security.aspx.	
5.1.3.4	Data in the proposed Solution may be confidential and must be handled in the most secure ways practical. This includes protection of data throughout its entire lifecycle including when at rest, when transmitted across networks, when being processed, and when reported. The proposed Solution must provide an industry standard way to accomplish these goals.	
5.1.3.5	Data exchanged between client and host software, as well as between systems must be managed in a secure way by the proposed Solution. The proposed Solution data must never be exchanged in clear text or original format. The proposed Solution must provide an industry standard way of accomplishing this goal.	4
5.1.3.5.1	Provides isolation and loose coupling between systems.	
5.1.3.5.2	Provides the ability to isolate other applications from changes to the proposed Solution.	
5.1.3.5.3	Separates functional dependencies (e.g., business rules for messaging) from non-functional dependencies (e.g., types of messaging)	
5.1.4	The Washington Department of Ecology has developed several Geographic Information System (GIS) web services which could be	

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	consumed by the proposed Solution. These include, but are not limited to, Open Geospatial Consortium (OGC) Web Map Service (WMS) Version 1.1.1 or later http://www.opengeospatial.org/standards/wms); OGC Web Feature Service (WFS) Version 1.0.0 or later (http://www.opengeospatial.org/standards/wfs); and a GeoProcessing Web Service for reporting geospatial attributes given a reported location. The GeoProcessing Web Service will accept a submitted Geographic Markup Language (GML) (http://www.opengeospatial.org/standards/gml) document and return an XML document.	
5.1.4.1	The proposed Solution must include seamless integration of geospatial information including the ability to create, read, update, delete, and store geospatial data, and to capture and store geospatial metadata associated with coordinate reference system, and store the geospatial data using the Washington State Geographic Information Technology Standards for Horizontal Datum and Coordinate System (*http://isb.wa.gov/policies/portfolio/601S.doc*).	
5.1.4.2	OFM desires that the proposed Solution utilize Environmental Systems Research Institute's Spatial Database Engine (ArcSDE) to manage point, line, and polygon spatial data.	
5.1.4.3	OFM desires that the proposed Solution consume OGC WMS and WFS services.	
5.1.4.4	OFM desires that the proposed Solution report geographic locations using OGC GML.	
5.1.5.1	The OFM desires that the proposed Solution include all required application components.	
5.1.5.2	The OFM requires any third party application software, other than operating and database systems, required in order to fully support the functionality of the proposed Solution be disclosed, including specifications of any software add-ons or utility applications that are required or recommended for configuration, customization, enhancement, maintenance, operation and implementation and any third-party software licenses to be signed by OFM.	
5.1.5.3	OFM currently has a standard 30-day test cycle for the deployment of new Microsoft security updates and/or patches.	
5.1.5.4	This implementation is intended for use across multiple Washington State agencies that require some level of autonomy with system elements such as data and business rules. The proposed Solution	

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	must provide a method for such autonomy.	
5.1.5.5	OFM application deployment model requires four (4) separate environments: development, testing, training, and production use. The proposed Solution must support this deployment model and environments.	3
5.1.5.6	Washington State agencies may have agreements that span 20, 50, or longer years. The proposed Solution must provide the ability to enter dates beyond the year 2079 and prior to January 1, 1957.	
5.1.5.7	All public records, regardless of the medium, are required to be maintained and disposed of by State agencies in accordance with statute. Public records have different retention periods based on their content. Some agreements may require retention of a minimum of six years past its termination date.	
5.1.5.8	OFM upholds the right of any person or organization to inspect and obtain copies of public records. All public records requests shall be honored unless the information requested is exempt from disclosure by state law. Compliance with the 42.56 RCW Public Records and the State Ethics Law requires that the OFM balance the public's right to access with the need to protect legitimate confidentiality interests. OFM may deny public access to information that is deemed exempt from public disclosure. The OFM desires that the proposed Solution provide the ability to redact information deemed exempt from public disclosure.	
5.1.5.9	Financial and Administrative systems for the State of Washington are subject to audit by the State Auditors Office and the Federal Government. The proposed Solution must provide the ability to maintain transactional dated history (audit trail) for all key changes to data. The audit trail must include, at a minimum, a date/time stamp, the type of change that was made, and the user responsible for making the change.	
5.1.5.10	The OFM desires that the proposed Solution provide the ability to spell check text in specific text fields.	
5.1.5.11	The OFM desires that the proposed Solution provide the ability to create links to other web sites, internet sites, internet documents, documents stored on agency intranet sites (that can only be accessed by authorized users in that agency), and documents stored on individual workstations (that can only be accessed by that individual).	
5.1.5.12	The OFM requires system administrators to have the capability to	

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	create and configure an unlimited number of custom fields.	
5.1.6	State of Washington agreement data are stored in disparate systems. The OFM desires that the proposed Solution provide a data migration utility for uploading historical data.	

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8. DELIVERABLE FINAL APPROVAL

The following are the required approvers of this deliverable, Hardware / Software Specifications. Approvers must select one of these dispositions after reviewing it:

1. I approve this deliverable and have no further questions or comments.

2. I conditionally approve this deliverable, contingent on the corrections below.

Approver: Doug Beam   Disposition   Date

Approver: Carol Baque   Disposition   Date

Comments:

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Appendix A. O&PEN Load Testing

OGMA conducted extensive performance testing of the O&PEN application about eighteen months ago at an HP solutions center. During these tests, the O&PEN application was operated on a number of different platforms with different configurations.

In general, the baseline configurations were built upon eight core processors, 4 x 2 for X64 and 8 x 1 for Itanium platforms. The general findings for the tests that were run over a three week period may be summarized as follows:

- The overall performance of the system was sufficient to support more than 2,000 concurrently active users.

- There was no significant difference in the performance, throughput and response times between the X64 and Itanium based platforms.

- Given the price differential between the X64 and Itanium platforms, the X64 based configurations were determined to be more cost effective

- Where the database server had a relatively large memory configuration (32 GB), there was no difference in the I/O system efficiency and responsiveness between the use of a SAN and locally attached storage (RAID 10).

The original test plan called for changes to the memory configuration of the test platforms. However, this was not possible because the solution center policy prohibited reconfiguring the memory on the test platforms. Therefore, the impact of varying memory configurations on the application was not quantitatively evaluated. However, qualitative evaluations were conducted and it is projected that SAN based systems can be expected to provide improved response and throughput when the memory configuration is reduced to the point where the database indexes and cache can no longer be maintained in memory and have to be cached to the I/O subsystem.

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Appendix B. Revision Log

Date	Description	Author
2/28/08	Draft submitted for review	Fred Hirschfeld
2/29/08	Added some additional information from OGMA on load testing and performance.	Fred Hirschfeld
3/9/08	Revised based on initial document review with OFM	Colby Cavin
3/10/08	Revised based on GCLM Infrastructure Review meeting with OFM	Colby Cavin